

## REMARKS/ARGUMENTS

### Claims

Claim 1 has been amended provide the photodiodes are forward-biased. Forward-biasing of the photodiodes is taught in the specification in the electronic schematics, namely Figures 1-5. Due to the increased junction capacitance of forward biasing, the apparatus provides dampened voltage variation due to changes in incident light. For this application, dampened voltage variation can be desirable, whereas for to Baker, where response to rapidly-varying input voltage is desired, it would be detrimental.

Claim 2 is in its originally presented form.

Claim 3 is in its originally presented form.

Claim 4 is in its originally presented form.

Claim 5 is in its originally presented form.

Claim 6 is in its originally presented form.

Claim 7 is in its originally presented form.

Claim 8 is in its originally presented form.

Claim 9 has been amended provide the photodiodes are forward-biased. Forward-biasing of the photodiodes is taught in the specification in the electronic schematics, namely Figures 1-5. Due to the increased junction capacitance of forward biasing, the apparatus provides dampened voltage variation due to changes in incident light, as opposed to the instantly-varying voltage of U.S. Patent 5,517,154 issued to Baker, in which the photodiodes are reverse-biased.

Claim 10 is in its originally presented form.

Claim 11 is in its originally presented form.

Claim 12 is in its originally presented form.

Claim 13 has been amended provide the photodiodes are forward-biased. Forward-biasing of the photodiodes is taught in the specification in the electronic schematics, namely Figures 1-5. Due to the increased junction capacitance of forward biasing, the apparatus provides dampened voltage variation due to changes in incident light, as opposed to the instantly-varying voltage of U.S. Patent 5,517,154 issued to Baker, in which the photodiodes are reverse-biased.

Claim 14 is in its originally presented form.

Claim 15 is in its originally presented form.

Claim 16 is in its originally presented form.

Claim 17 is in its originally presented form.

Claim 18 is in its originally presented form.

Claim 19 is in its originally presented form.

Claim 20 is in its originally presented form.

Claim 21 has been amended provide the photodiodes are forward-biased. Forward-biasing of the photodiodes is taught in the specification in the electornic schematics, namely Figures 1-5. Due to the increased junction capacitance of forward biasing, the apparatus provides dampened voltage variation due to changes in incident light, as opposed to the instantly-varying voltage of U.S. Patent 5,517,154 issued to Baker, in which the photodiodes are reverse-biased.

Claim 22 is in its originally presented form.

Claim 23 is in its originally presented form.

*Claim Rejections – 35 U.S.C. § 102*

Applicant respectfully requests reconsideration of the findings of anticipation in light of the prior art, specifically *Baker* (U.S. Pat. No. 5,517,154) with regards to Claim 1, and Claims 2 and 8 dependent therefrom, Claim 9, and Claims 10 and 11 dependent therefrom, Claim 13, and claims 14 and 20 dependent therefrom, and Claim 21 and Claim 22 dependent therefrom. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. MPEP § 2131. A rejection based on 35 U.S.C. 102(e) can be overcome by amending the claims to patentably distinguish over the prior art. MPEP § 706.02(b)

Applicant respectfully offers that the prior art does not teach all of the elements of amended claims 1, 9, 13, and Claim 21. The structural differences in the two inventions result in different operation and output. Such differences include the relative biasing of the photodiodes in each device. However to resolve, in part, any discrepancy between the two, Claims 1, 9, 13 and 20 have been amended to expressly identify that the photodiodes are forward-biased.

Forward-biasing of the photodiodes is taught in the specification in the electronic schematics, namely Figures 1-5.

The invention made the subject of the '154 patent is patentably distinct and does not anticipate the invention made the subject of the instant application due to the respectively opposite biasing of the photodiodes found in each device and the resulting opposite response time and fluctuation characteristics of the output voltage.

The '154 patent teaches use of the photodiodes in reversed-biased, current generating mode. The use of photodiodes in reverse-bias, such that light striking the diode material generates a current proportional to the light intensity and essentially independent of the bias voltage, is well known. A (photo)diode is reverse biased when the voltage at the cathode of the diode is positive with respect to the anode. Figure 1 of the '154 patent teaches connection of the voltage sources,  $-V_i$  and  $+V$ , to the anode of photodiode 70 and to the cathode of photodiode 72, respectively. As a result, in operation the response time between current input of diode 64 and currents generated by photodiodes 70 and 72 is nearly instantaneous with essentially no increase in said generated currents in response to changes in  $-V_i$  and  $+V$ . Such operation is advantageous for use with oscilloscopes, as taught by the '154 patent. This is particularly true since, due to the low junction capacitance of the photodiode in high-voltage, reversed-bias operation, output variations are relatively fast.

Moreover, the '154 patent teaches use of an active element 80 and supplemental power source ( $+V$ ) on the isolated side to generate a voltage from the current provided by photodiode 72.

The present invention teaches the use of the photodiodes in forward-biased, voltage sourcing mode. The use of photodiodes in forward-bias, such that when light strikes the diode material generates a current proportional to light intensity, said current flowing through the anode to cathode junction of the diode, or through an externally-connected resistance, thereby producing a forward voltage drop across the junction, is well known. (The voltage drop across the junction is logarithmically related to the light-generated current.) A (photo)diode is forward biased when the voltage at the anode of the diode is positive with respect to that at the cathode.

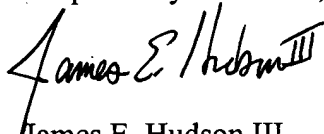
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In the present invention, photodiodes 36 and 37 each are forward biased by virtue of the light-generated current flowing through the junction of photodiodes 36 and 37 and the resistances 12/22/23/24. Due to the increased junction capacitance of the photodiode in forward-biased operation, output variations are dampened. Such operation is advantageous for use with precision analytical equipment where rapid variations in bias voltage may produce inaccurate results.

Additionally, the present invention uses no active element on the isolated side but instead relies entirely on passive components, resistors 12/24, connected with photodiodes 36/60 to generate the corresponding current. No supplemental power source is used in the present invention on the isolated side.

Applicant respectfully requests that a Notice of Allowance be issued in this case.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "James E. Hudson III". The signature is written in a cursive, somewhat stylized script.

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### **AMENDMENTS TO THE DRAWINGS**

The attached sheets of drawings include replacement sheets for Figures 1-5. The sheets on which Figs. 1-5 appear, replace the original sheets that included Figs. 1-5. No changes have been made to the drawings save and except better lining of the drawings and numbers.

Attachment: Replacement Sheets